Human Organotypic Cultured Cardiac Slices: New Platform For High Throughput Preclinical Human Trials

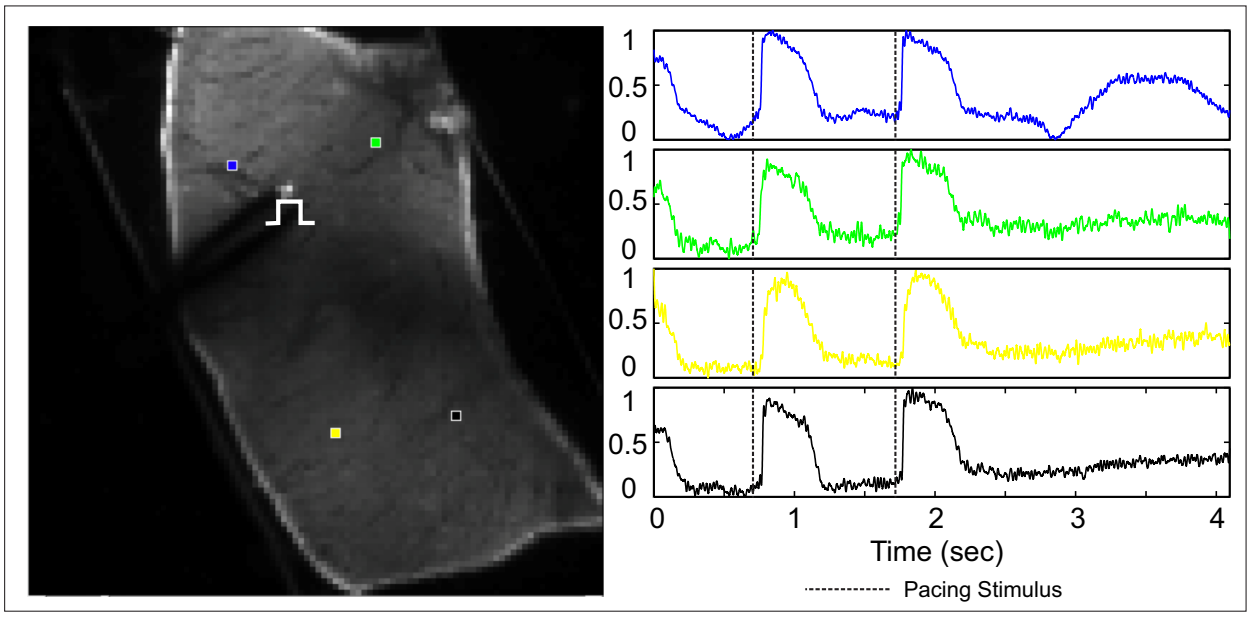
Kang C, Qiao Y, Li G, Baechle K, Camelliti P, Rentschler S, Efimov IR

Supplementary Table and Figures

Preparation	Pro	Con
Isolated Primary Cells	- Only model for ion channels currents	- Absence of cell to cell coupling - Chunk isolation process alters electrophysiology
iPSC- Derived Cardiomyocytes (Monolayers and Tissue Constructs)	- Highest throughput for therapy screening - Genetic manipulation - Patient specific sampling - Unlimited tissue supply	- Unable to fully replicate adult tissue characteristics currently - Cell alignment and cell coupling is disorganized
Coronary Perfused Intact Tissue	- Large Scale electrophysiology - Tissue conduction properties - Full scaled arrhythmia and defibrillation study	- Requires Intact coronary system - Few preparations per heart - Unable to be cultured
Tissue Slices	- Tissue level electrophysiology from anywhere on the heart - Viable in organotypic culture for chronic studies - Genetic manipulation	- Lower optical Signal-to-noise ratio compared to wedge preparations - Cannot study true ionic currents - Non-patient specific

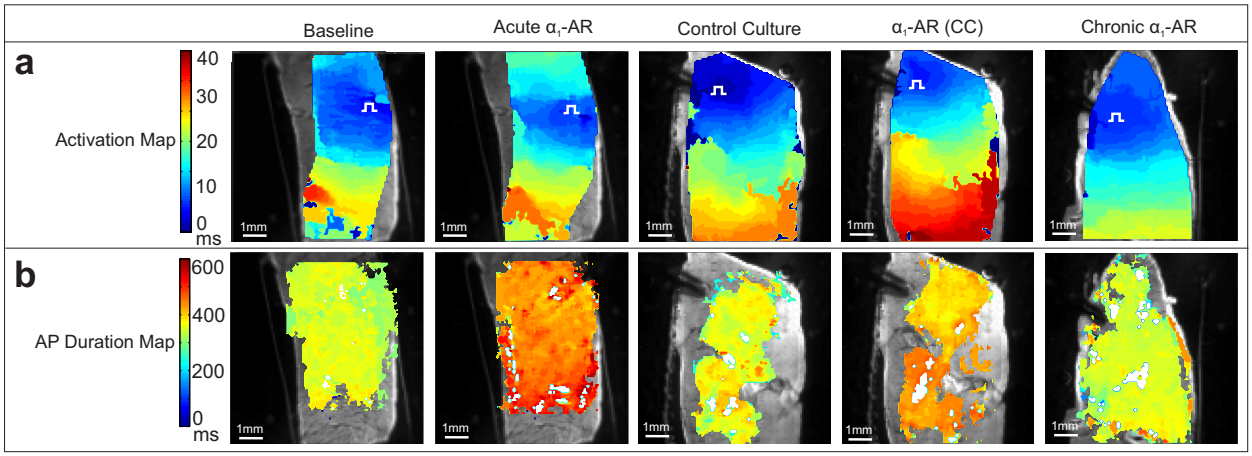
Supplemental Table 1. Comparison between *ex-vivo* human cardiac models

Pros and cons of each established and currently developing modeling for human *ex-vivo* cardiac study.



Supplemental Figure 1. Quiescent Left Ventricular Slices

Ventricular slices from donor tissue do not exhibit automaticity. Action potential can only be observed and recorded during electrical stimulation.



Supplemental Figure 2. Activation and AP Duration maps of α_1-AR stimulation

Ventricular slices from donor hearts are treated either acutely (fresh and after control culture) or chronically. (a) Activation map of slices at each condition under 1 Hz pacing. Activation appears slower under acute α_1-AR stimulation and faster under chronic α_1-AR stimulation. (b) Representative AP duration maps of slices at each condition under 1 Hz pacing. Acute α_1-AR stimulation clearly increased AP duration, while chronic α_1-AR stimulation had the reverse effect.